L-Band Pencil-Tube Oscillator-Amplifier

1090 Mc/s — 500 W PEAK

These Units[d] are Designed to Implement New Airborne Transponder Systems

ELECTRICAL

Heater, for Unipotential Cathode		
Voltage (AC or DC)	6.3 ± 10%	V
Current at 6.3 V (Total)	0.66 max	A
Frequency	1090	Mc/s
RF Coaxial Output		
Terminal	Sealectro No.50-047-0129	
Characteristic impedance (approx.)	50	Ω
Output VSWR	1.5:1	
All phase angles		

MECHANICAL

Operating Position	Any
Dimensions and Terminal Connections	See *Dimensional Outlines*
Weight (Approx.)	7 oz

ENVIRONMENTAL

The units will remain stable within ± 2.5 Mc/s in frequency and ± 3 dB in peak power output (from nominal conditions) under any combination of the following conditions:

Vibration	Curve IV of MIL-E-5400 and Curve IV MIL-T-5422E	
Shock	15	g
Ambient Temperature	-54 to 95	°C
Altitude	30000	ft
Output VSWR	1.5:1	
All phase angles		
Plate and Heater Voltage Variation	±10	%
Duty Factor	0.01	

GRID-PULSED OSCILLATOR—CLASS C

Absolute-Maximum Ratings

For a maximum "ON" time[a] of 12.5[b] microseconds in any 2500-microsecond interval

DC Plate Voltage	1100	V
Each unit		
Peak Oscillator Grid Current	0.5	A
Peak Amplifier Cathode Current	2	A
Peak Plate Current		
Oscillator	0.7	A
Amplifier	1.5	A
Plate Dissipation	18	W
Total		
Peak Heater-Cathode Voltage		
Heater negative with respect to cathode	60	V
Heater positive with respect to cathode	60	V

TYPICAL OPERATION

With Rectangular Wave Shape in Grid-Drive Circuit at 1090 Mc/s

With duty factor[c] of 0.01 and pulse duration of 0.45 microsecond

DC Plate Voltage Each unit	1000	V
Oscillator Grid Bias	-80	V
Amplifier Cathode Bias	25	V
DC Plate Current Total	20	mA
Useful Power Output At peak of pulse	500	W

[a] *"ON"* time is defined as the sum of the duration of all individual pulses which occur during the indicated interval. *Pulse duration* is defined as the time interval between the two points on the pulse at which the instantaneous value is 70% of the peak power value. The *peak value* is defined as the maximum value of a smooth curve through the average of the fluctuations over the top portion of the pulse.

[b] This value is for continuous pulsing. The *"ON"* time can be 25 microseconds when the units are operated 10 minutes per hour.

[c] Duty factor is the product of pulse duration and repetition rate. For variable pulse durations and pulse repetition rates, the duty factor is defined as the ratio of the time *"ON"* to total elapsed time in any 2500-microsecond interval.

[d] The ruggedized oscillator-amplifier combination is built to satisfy all AIMS/FAA (Army Integrated Meteorological Systems) requirements.

RECOMMENDED GRID-PULSE AMPLIFIER (MODULATOR)

UG-625B BNC CONNECTOR

50 OHMS 1 WATT

270 OHMS 1 WATT

470pF

INPUT PULSE

14V

.45 µs

ALADDIN 94-1239 OR PCA 6218

3

4

1

2

150 OHMS 1 WATT

+25V

PARASITIC SUPPRESSOR*

TYPE 2N1893

5.6 OHMS 1 WATT

27 OHMS 1 WATT

5pF

4µF 150V

TYPE 2N1893

27 OHMS 1 WATT

5.6 OHMS 1 WATT

+25 V

0

-80V

OUTPUT PULSE

1/16 AMP FUSE

TO GRID

150 OHMS 1 WATT

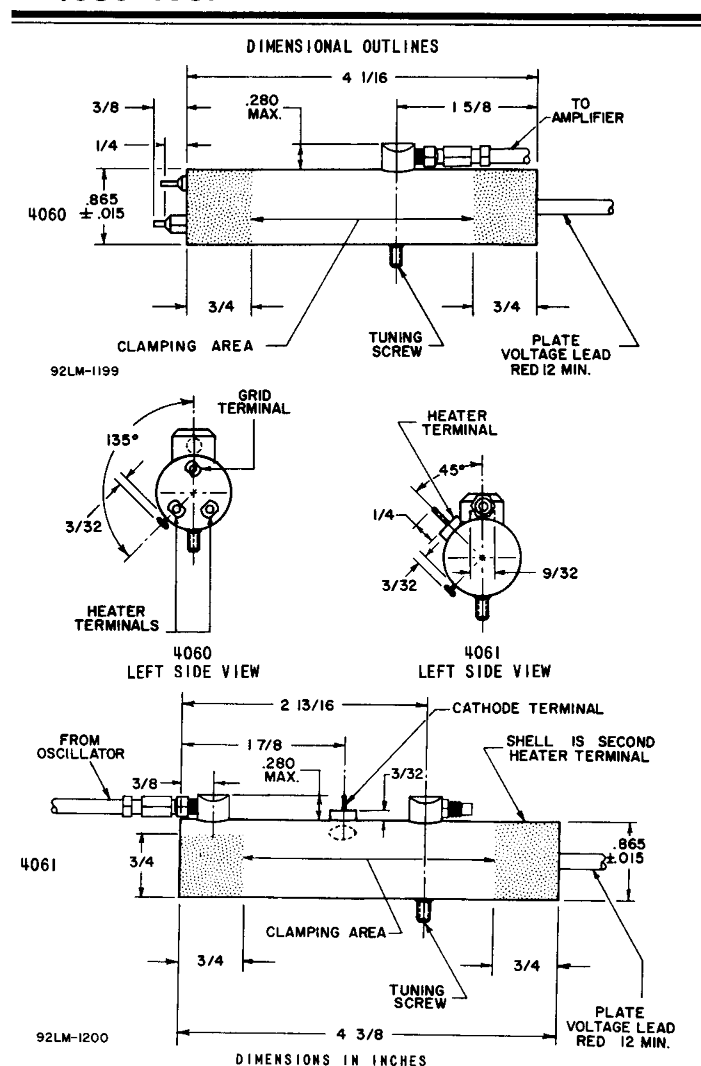
51pF

470 OHMS 1 WATT

-80V

*0.3 µH WINDING ON A NON-INDUCTIVE 50-OHM VITREOUS RESISTOR.

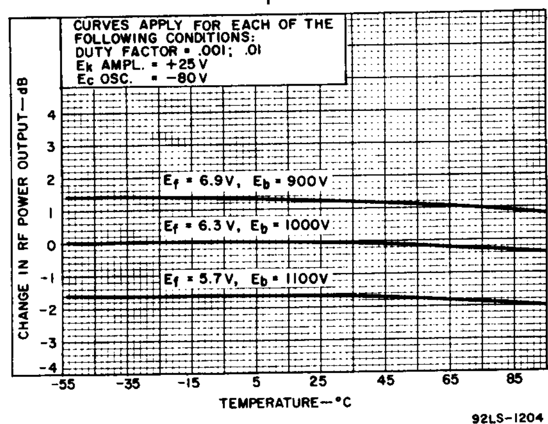
92LM-1201



These units are supplied without the mounting brackets; they are also available with brackets upon request.

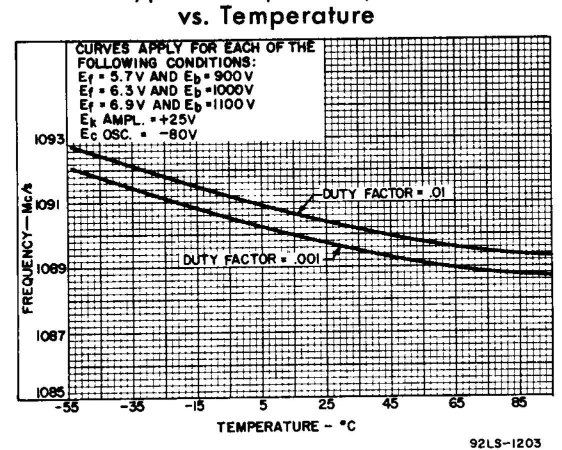
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Typical Change in Power Output vs. Temperature



92LS-1204

Typical Output Frequency vs. Temperature



92LS-1203